WEATHER OF NORTH AMERICA AND ADJACENT OCEANS.

GENERAL CONDITIONS.

By A. J. HENRY, Meteorologist.

The distribution of normal pressure over the Northern Hemisphere for March differs but slightly from that of February except that there is a rather pronounced fall over the great Continental Highs amounting to as much as 0.20 inch in Siberia and about half that much on the North American Continent. Normal pressure, February to March, increases in the polar regions, especially over Greenland and oceanic areas southward therefrom to 45 degrees N. latitude.

The pressure distribution of the current month was mostly in accordance with the normal. Stormy weather was experienced locally over portions of the oceanic areas and over continental areas a few storms of tornadic violence were reported; otherwise seasonal weather was experienced.

NORTH PACIFIC OCEAN.

By F. G. TINGLEY.

As indicated in the report of conditions for February, a storm of some importance appeared to be developing in the region immediately to the eastward of Japan at the close of the month. Subsequent reports have confirmed this. During the period from Feb. 23–28 winds as high as force 12 were experienced within the area between the 140th and 165th meridians, east longitude, and the 30th and 40th parallels.

The weather continued generally stormy within this area during the first week of March, winds of gale force being reported from some point every day until the 8th, inclusive. East of the 165th meridian quiet conditions prevailed, with only occasional gales, of moderate force, mostly from a westerly direction.

During the second week of the month storm conditions gradually progressed to the eastern part of the ocean, where, from the 11th to the 15th, winds of gale force prevailed very generally.

After the 8th the western part of the ocean was relatively free from storms, only one having thus far been reported. This appears to have been of limited extent but of considerable intensity. It occurred on the 20th and 21st in the region lying between the 160th and 170th meridians and near the 35th parallel. Two vessels, the Japanese steamships *Darien Maru* and *African Maru* which encountered this gale, report winds of force 10, with tremendous seas.

Altogether, winds of gale force were reported by different vessels for a total of 47 times during the month, as follows: Force 7, 29 times; force 8, 10 times; force 9, 2 times; force 10, 5 times; force 11, once.

No reports have been received to indicate that any unusual conditions or noteworthy phenomena occurred on the North Pacific Ocean during the month.

NORTH AMERICA.

By A. J. HENRY, Meteorologist.

The temperature in the eastern portions of the United States and Canada was mild for the season, thus maintaining the characteristics of the previous month; and the winter as a whole must be classed as a mild one. The temperature in the northern tier of States west of the upper Lakes was below the seasonal normal and also to a greater or less extent in the Rocky Mountain region and thence westward to the coast.

Precipitation was generally ample in amount and well distributed both in time and space. The snow cover was decidedly less than the average, except in the higher altitudes of the Rocky Mountain region.

Severe local storms and tornadoes occurred, but their number was not in excess of the normal expectancy.

Severe floods were entirely absent and the usual spring rise in the rivers in northern districts was distinctly affected by the absence of any considerable snow cover.

NORTH ATLANTIC OCEAN.

By F. A. YOUNG.

The general atmospheric conditions for March, 1919, showed a decided contrast to those of the previous month when the average pressure was considerably below the normal. For the month under discussion the mean barometric readings at a number of stations on the Atlantic and Gulf coasts were above the normal, the same conditions holding true at the Azores and Bermudas. Not enough vessel reports were received in time to determine accurately the average pressure over the different divisions of the ocean, although from an examination of those at hand it is evident that over the steamer lanes the pressure was also higher than usual.

The number of days on which gales occurred was apparently not far from the normal over the greater part of the ocean, except that in the western part of the steamer lanes they seemed to be slightly more frequent than usual.

On March 1 a LOW was central in the vicinity of latitude 45°, longitude 30°, and moderate to strong westerly and northwesterly gales prevailed over the area between the 38th and 45th parallels and the 35th and 55th meridians, accompanied by rain and hail over the eastern section. During the next four days this disturbance moved eastward with a fairly uniform rate, diminishing gradually in intensity, and on the 5th the center was near Brest, France.

On the 4th there was a well-developed LOW near latitude 43° and longitude 53° (See chart IX. The cyclonic movement of the wind was very marked, and southerly gales of from 40 to 60 miles were reported from the easterly quadrants, while northerly winds of about the same force prevailed west of the center. This disturbance drifted slowly eastward, and on the 5th was central near latitude 43°, longitude 43°, the storm area having contracted slightly since the previous day.

From the 6th to the 8th the circulation of the air, for the most part, was comparatively sluggish, and unusually high pressure prevailed over the western division of the ocean. On the latter date, however, one vessel near latitude 55°, longitude 27°, reported a westerly gale the morning of the 9th westerly gales were encountered in of about 50 miles an hour, accompanied by "hail." On mid-ocean, north of the 45th parallel, and while no storm reports were received from vessels off the American coast, the anemometer at New York registered a velocity of 48 miles an hour from the east, with a maximum force of 56 miles during the night of the 8th.

On the 10th there was a well-developed LOW central near Halifax, N. S., where the barometer reading was 29.40 inches, while at St. Johns, Newfoundland, it read 30.24

inches, at Norfolk, Va., 30.14 inches, and at a point near latitude 41°, longitude 56°, 30.20 inches. The steep gradient was responsible for winds of gale force at different points along the American coast between Newfoundland and Georgia. On the 11th the center of this LOW was near St. Johns where the barometer had fallen to 29.40 inches since the previous day; the wind had diminished in force, and was light to moderate.

On the 12th moderate gales were reported about 8° east of Bermuda, and also over the eastern part of the steamer tracks.

On the 13th a point near latitude 45°, longitude 41°, was the center of a violent disturbance. (See chart IX.) The Danish steamer *Helig Olaf*, reported that at 5:15 p. m., March 13, while near latitude 47°, 45′, longitude 38°, 50′, the barometer reading was 28.87 inches, and the wind blowing with hurricane force from the southwest, shifting shortly afterward to the northwest. On that day reports were received from vessels between the 35th and 50th parallels and 35th and 60th meridians, showing that winds of gale force were prevalent over a large part of that region. This LOW moved rapidly northeastward, and on the 14th, the center was near latitude 55°, longitude 30°; the storm area had contracted since the previous day, although southwesterly winds of from 40 to 65 miles an hour were still encountered between the 45th and 55th parallels, and the 30th and 40th meridians.

From the 15th to the 20th moderate weather prevailed, the pressure being comparatively high over the entire ocean, except that on the 19th and 20th readings of less than 30 inches were recorded by vessels near the European coast, and also at the British and French meteorological stations.

From the 21st to the 24th a few scattered reports were received from vessels along the American coast, denoting moderate northeasterly gales, while these were interspersed with many that experienced winds of less than gale force, some of them also reporting fog. On the 21st the barometric reading at St. Johns, N. F., was 30.50 nches and at Bermuda, 29.70 inches. However, the unusually steep gradient, and the complete reversal of the normal distribution of pressure, seemed to have little effect on the general weather conditions in the intermediate region where only light to moderate winds prevailed.

By the 25th, the barometer at St. Johns had fallen to 29.20 inches, and the center of a well-developed LOW was about 250 miles south of that point, while northwesterly gales, with snow, were encountered by vessels in the southwest quadrants. This disturbance remained nearly stationary during the next 24 hours, and on the 26th westerly winds of gale force were encountered between the 35th and 45th parallels and the 55th and 60th meridians.

From the afternoon of the 27th to the morning of the 30th an exceptionally severe storm swept the American coast between Hatteras and Nantucket. The observer on the American steamship *Amolco* stated in the storm-log that the lowest barometer reading was 29.35 inches at 6 p. m., on the 27th, when the vessel was near latitude 35° 8′, longitude 73° 21′, and at 11:45 p. m. on that date the wind shifted from south to northwest, and remained in that quarter until the end of the storm on the 30th, while the highest velocity of the wind was 57 miles an hour. The Dutch steamship *Bawean*, first ran into this blow on the 28th, and the lowest barometer reading was 29.15 inches at 1 a. m. March 29, latitude 35° 6′, longitude 69° 14′; highest velocity of the wind 55 miles an hour, with no shifts. At the time of observation on the morning of the 28th, northwest gales of from 50 to 65 miles an hour, accompanied by snow in the northern portions, swept the coast between Hatteras and New York, and the anemometer at the latter station registered a maximum velocity of 93 miles an hour, during the night of the 28th. On the morning of the 29th, the storm still maintained its force, and did not begin to diminish appreciably until the 30th, and even on that day moderate gales were reported between the 35th and 40th parallels, and the 60th meridian and the American coast. (See chart IX.)

NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

FLOODS IN BRAZIL.

Rio de Janeiro, March 18, 1919.—"Various localities in Brazil are suffering from floods. The town of Joazeiro, State of Bahia, is inundated and thousands of houses have been wrecked by the water. The rivers in various parts of the republic are above flood stage and considerable damage is resulting."—*Associated Press.*

BRITISH WEATHER, MARCH, 1919.

A large anticyclone maintained a fairly normal position over the south of the North Atlantic, but at frequent intervals there was a second high-pressure system, sometimes in the Icelandic region, at other times over northern Europe. In these circumstances, the British Isles were exposed to numerous disturbances.

In the first 10 days of March rains were generally heavy; at Greenwich, in the three days ending March 5, the rainfall measured 1.49 inches, which is 0.03 inch more than the 60 years' average for the whole month.

The second half of the month was much colder than the first, the difference being 7° F. at Greenwich. Between the 23d and 26th, sharp frosts were experienced in all districts; and on the night of the 28th–29th the heaviest snowstorm of the winter occurred, the snowfall exceeding a foot in parts of southern England.

The general rainfall expressed as a percentage of the average was: England and Wales, 196; Scotland, 105; Ireland, 112.—*Symons's Meteorological Mag., Apr., 1919, p. 33; and Nature (London), Mar. 13, p. 30, and Apr. 3, 1919, p. 90.*